

Leyden Museum advocates the complete separation of the study and exhibition series, and insists on the great importance of the absolute protection of the specimens from fire, dust, and light.

Prof. Plate described a new microscope suitable for exhibition in museums; Prof. Forel a new method of collecting specimens inhabiting the deep water in lakes; while Prof. Fujii, of Tokyo, referred to some micro-technical apparatus of his own invention.

Finally, a demonstration was given on the installations of the "concilium bibliographicum," by Dr. Field.

VII.—ZOOGEOGRAPHY.

Mr. Schmidt, of St. Petersburg, explained the distribution of the fishes in the northern Pacific, and mentioned that the northern fauna of Japan should be considered as belonging to the Arctic region, and that the fishes of southern Japan and the west coast of North America are very distinct from those of the northern parts.

Prof. Simroth gave his views on the origin of the Alps, based chiefly on the distribution of the Mollusca. Dr. Pellegrin, of Paris, described the fish-fauna found in Lake Tchad and the Chari River, which he declares to be very similar to that of the Nile.

Prof. Forel gave his experiences on the occurrence of *Larus ridibundus* on the Lake of Geneva. It appears that thousands of these gulls are present on the shores of the lake during winter, and that they migrate northward in March, to return again in October with their young. A few remain all the year round. The principal lines of migration of birds across Switzerland were then described by Prof. Fatio, of Geneva.

The congress ended with a couple of days of most pleasant social intercourse. The members were afforded an opportunity of seeing the beauties of the Bernese Oberland during an excursion along the Lake of Thun, and an afternoon spent at Interlaken, where a final meeting was held in the "Kursaal." Saturday was devoted to a trip to Geneva, where, after a lunch and a visit to the museums, the venerable Mr. de Saussure entertained the guests at his country seat near the city, and a Venetian *fête* with fireworks brought the congress to a close.

ROTATION OF SATURN'S RINGS.

ON 1903 November 6, 5h. 25m., I observed a large diffused white spot a little north-east of the extremity of the western ansa. It was placed on the bright rim of the interior ring, just bordering Cassini's division, and appeared to extend faintly over the outer ring.

November 7 was cloudy, but on November 8 there was a clear sky and pretty good definition, but no certain differences of tint could be remarked in the individual rings.

On November 9, 5h. 10m., the planet was very faint, and the two ansæ seemed equally bright. At 5h. 50m., however, the western ansa was decidedly the more luminous, and the aspect appeared similar to that on November 6.

November 10, 11, 12, and 13 were cloudy; November 14 was stormy with fine intervals, but definition was very unsteady, and no white spot could be discerned on the rings.

On November 15 there was a clear, frosty sky. At 5h. 50m., under good definition, the ring seemed notably brighter on western than on eastern ansa.

On November 16 definition was very bad, and no details could be satisfactorily made out. November 17 was cloudy.

On November 18, 5h. to 5h. 40m., there was a good deal of fog, and the planet's image appeared very faint. The western ansa seemed decidedly brighter than the other, but the luminosity appeared diffused and not caused by a definite spot.

No satisfactory observations were secured after the latter date. The weather was extremely unsettled, and definition generally very bad, so that though the planet was examined, whenever visible, until December 11, no further inequalities in the luminosity of the rings were noted.

The bright area seen on November 6 and several other evenings appeared recurrent in same position at intervals of 3 days, whence I infer that the rotation period of the

ring is about 14h. 24m. This determination is, however, extremely rough, and only useful as affording evidence of the approximate value.

After I had arrived at this result, I consulted various authors to find what previous estimates had been made as to the rotation of the rings.

Laplace theoretically computed that the ring ought to rotate in 10h. 33m. 36s. (Chambers's "Descriptive Astronomy," third edition, p. 143). In Laplace's "System du Monde," however, it is stated that Saturn rotates in 0.428 day and the ring in 0.437 day, the equivalents being = 10h. 16m. 17.2s. and 10h. 29m. 16.8s.

Sir W. Herschel, from a spot or luminous point seen on the interior ring in July, 1789, ascertained that the ring revolved round the ball in 10h. 32m. 15.4s. (*Phil. Trans.*, 1790, vol. lxxx. p. 479).

Secchi obtained many measures of Saturn's system in 1854-6, and apparently detected an ellipticity in the rings, for the discordances were considerable, and harmonised at intervals of 3 and 9 days. He concluded that a period corresponding to that which a satellite would have if situated on the outer ring, viz.

14h. 23m. 18s.,

would satisfy them (*Monthly Notices*, vol. xvi. p. 52). The correspondence between Secchi's period and my own roughly ascertained value, being quite independent, is rather singular.

Now that Saturn is very favourably visible, it is to be hoped that observers will frequently examine the rings for differences in tint or tone which may afford material for the rotation period to be re-determined.

W. F. DENNING.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE title of professor has been conferred on Dr. Karl Schreiber, of Greifswald, for physics, and on Dr. Robert Pschorr, of Berlin, for chemistry.

MR. ALEXANDER LAUDER, senior demonstrator in chemistry in the University College of North Wales, Bangor, has been appointed lecturer in agricultural chemistry in the Edinburgh and East of Scotland College of Agriculture.

In connection with the technical college which will shortly be proceeded with at Stoke-on-Trent, it is proposed to have a school of pottery, which shall not only train pupils, but also act as a central advisory and analytical department for manufacturers. There will also be a mining department. The estimated cost of the building, some 25,000*l.*, has been practically assured, the North Staffordshire Institute of Mining and Mechanical Engineers contributing 4000*l.*, the Staffordshire County Council 4000*l.*, the training authority 6000*l.*, while close on 10,000*l.* has been promised as voluntary contributions.

DR. ANTON LAMPE and Dr. Hans Benndorf, of Vienna, and Dr. F. Streintz, of Graz, have been appointed extraordinary professors of physics. Herr Reinhold Lutz has been appointed professor of mechanical engineering at the Aachen Technical College, Dr. George Schlesinger professor of the theory of mechanical implements in the Berlin Technical College. Dr. Karl Rohn, now professor of geometrical drawing in Dresden, has been appointed professor of mathematics in the University of Leipzig as from April 1, 1905. Dr. Ludwig Prandtl, now professor at Hanover, has been appointed to the chair of technical physics and agricultural mechanics at the University of Göttingen.

THE calendar for the session 1904-5 of the Merchant Venturers' Technical College, Bristol, indicates several improvements which have been made recently at this institution. Among these may be mentioned the new experimental steam engine, with its boiler and measuring appliances, and the experimental light and power station now in use by the students. The courses for engineering students have been re-arranged, and provision has been made for a fourth year's course in civil, mechanical, and electrical engineering. The staff of the engineering departments has been strengthened by the appointment of an additional lecturer.

SIR HENRY CRAIK, K.C.B., in his report for the year 1904 on secondary education in Scotland, says that the examiners are of opinion that the teaching of theory is still the weak point in the instruction in science given in the schools, though there has been some improvement since last session. This weakness is specially conspicuous in the subjects of magnetism, electricity, and hydrostatics. It would appear that most teachers rely too exclusively on the experiments done by the pupils in the laboratory, and do not supplement them sufficiently by full discussion and cross questioning, and by demonstration experiments. It is to be feared that the subjects mentioned are too often attempted by boys who are not sufficiently equipped with a previous knowledge of mathematics and dynamics, who would have been much more profitably employed in going through a course in heat or chemistry. It is satisfactory to find evidence of a tendency to simplify the courses followed in the schools.

THE Higher Education Subcommittee of the Lancashire Education Committee has issued a series of circulars detailing the provision made in the county for instruction in various branches of agriculture. In the first of the pamphlets full particulars are given of a scheme of agricultural education to be carried out at the County Council Farm, Hutton, the Harris Institute, Preston, and in various parts of the county during the session of 1904-5. The course in agriculture at the Harris Institute, Preston, extends over four years, and is intended to prepare youths for the practical work of a farmer's life by instructing them in the principles which underlie farming operations, and demonstrating—in the lecture room and on the farm—modern and scientific methods of agriculture. The instruction is free to approved students, and, in addition, the County Council allows a sum not exceeding ten shillings per week, either for board, lodging, or for travelling expenses, to each student in full attendance, not being a holder of an agricultural scholarship, who fulfils certain conditions laid down. The Higher Education Subcommittee has also made arrangements to consider applications from local committees, agricultural societies, and farmers' associations, for courses of lectures by members of the agricultural staff at the Harris Institute, Preston.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 29.—M. Mascart in the chair. —On the fall of Perseids in 1904: Henry **Perrotin**. The most favourable evenings for observations were August 9 to 14. Owing to the exceptional purity of the atmosphere at the summit of Mont Mounier (2740 metres) a large number of meteors were noted. As regards their points of appearance, disappearance, velocity, and brightness, the results clearly indicate the advantages possessed by stations at high altitudes for methodical observations of meteors.—On the approximate solution of certain congruences: Frédéric **Riesz**.—On the formulæ of tonometry and cryoscopy: E. **Ariès**. In a preceding communication it has been shown that the expression for the potential of each of the two substances in a dilute solution can be deduced from the law of van 't Hoff. In the present paper these results are extended to include the formulæ connecting the alteration of vapour pressure and of freezing point, deduced experimentally by Raoult.—On a case of globular lightning at Autun on July 16: M. **Roche**.—On the theory of macles: G. **Friedel**.—The passage from the root to the stem in *Primula Auricula*: H. **Ricome**.—Researches on the assimilation of some ternary substances by the higher plants: P. **Mazé** and A. **Perrier**. From the experiments described, it is shown that green plants, like fungi and micro-organisms, are capable of assimilating sugars, the only distinction between the two cases being that the former can create these substances at the expense of atmospheric carbon dioxide, whilst in the latter, the nitrous and nitric ferments are the only ones known to be able to take carbon from carbonic acid.—On the preservation of flour by cold: M. **Balland**.

NEW SOUTH WALES.

Linnean Society, July 27.—Dr. T. Storie Dixon, president, in the chair.—Notes on Australian Coccidæ ex Coll. W. W. Froggatt, with descriptions of new species, No. i.:

NO. 1819, VOL. 70]

E. Ernest **Green**. A species of *Chionaspis* found upon the undersurface of the leaves of *Eucalyptus tereticornis*, Sm., and the nut-grass Coccid, a species of *Antonina*, are described as new. The latter may be classed with the few beneficial species of Coccids, as it is credited with destroying the host-plant (*Cyperus rotundus*, Linn.), a most objectionable weed, over a large area of the Hunter River flats, N.S.W. —Three new generic names for Mollusca: Captain F. W. **Hutton**, F.R.S. The author finds, through the publication of the "Index Zoologicus," that the following generic names, published by him for land Mollusca, have been forestalled:—*Pyrrha*, by Cabanis in Aves, 1849; *Carthæa*, by Walker in Lepidoptera, 1858; and *Rhenea*, by Saalmüller in Lepidoptera, 1884. He therefore proposes the following names to replace them:—*Thermia* for *Pyrrha*; *Serpho* for *Carthæa*, and *Delos* for *Rhenea*.—On a new species of *Heteronympha*, and a new variety of *Tisiphone abeona*, Don.: G. A. **Waterhouse**.—On four new species of *Eucalyptus*: J. H. **Maiden**.

GÖTTINGEN.

Royal Society of Sciences.—The *Nachrichten* (physico-mathematical section), part iii. for 1904, contains the following memoirs communicated to the Society:—

May 14.—Ph. **Furtwängler**: On the construction of the *Klassenkörper* for any algebraic *Zahlkörper*. Lothar **Heffter**: On the definition of the definite integral in two dimensions, independently of previous integration. G. **Prasad**: On the notion of lines of curvature.

June 11.—J. **Stark**: Experiments on the genesis of the band- and the line-spectrum.

June 25.—David **Hilbert**: Principles of a general theory of linear integral equations.

CONTENTS.

PAGE

Social Types and Social Selection	449
Electricity, Old and New. By W. B. M.	450
Milk in Relation to Disease. By Prof. R. T. Hewlett	451
Our Book Shelf:—	
Marr and Shipley: "Handbook to the Natural History of Cambridgeshire."—R. L.	452
Classen: "Theorie der Elektrizität und des Magnetismus"	452
Fritsch: "Die Keimpflanzen der Gesneriaceen"	453
Zehnder: "Das Leben im Weltall"	453
Hayward: "First Stage Steam"	453
Letters to the Editor:	
On the Secondary Radiation due to the γ Rays of Radium.—A. S. Eve	454
A Source of the Ionisation of the Atmosphere.—J. R. Ashworth	454
Celtic Place-names.—Joseph Meehan; The Reviewer	454
The Striped Hawk-Moth—Rose Haig Thomas	455
Mountains and Mankind.—Douglas W. Freshfield	455
British Chemical Exhibit at the St. Louis Exhibition. By F. M. P.	455
The Limnological Stations on the Lake of Bolsena. (Illustrated.) By R. T. Günther	455
Notes	456
Our Astronomical Column:—	
The Line Spectrum of Copper	459
Ephemeris for the Return of Encke's Comet	459
Supposed Relation between Sun-spot Minima and Maxima Intensities	459
Ephemeris for Comet Tempel ₂	459
Direction of the Sun's Proper Motion	459
The British Association	
Section I.—Physiology.—(With Diagrams.)—Opening Address by Prof. C. S. Sherrington, M.A., D.Sc., M.D., LL.D., F.R.S., President of the Section	460
Section K.—Botany.—(With Diagrams.)—Opening Address by Francis Darwin, F.R.S., Fellow of Christ's College, President of the Section	466
The Sixth International Congress of Zoology	473
Rotation of Saturn's Rings. By W. F. Denning	475
University and Educational Intelligence	475
Societies and Academies	476